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ABSTRACT

This discussion of the major factors that appear to determine the pace of development of computer uses in education in developing nations focuses on Brunei, a tiny, oil-rich sultanate in South East Asia with a population of approximately a quarter of a million. Questions are often raised as to whether computers are required merely to follow the example of other countries rather than to address social and economic needs, and the momentum of progress in educational computer use varies from country to country, with Brunei tending to proceed rather more cautiously than most. A survey of the Brunei schools conducted in 1998 found that: (1) there were a small number of computer clubs in secondary schools; (2) there were computer assisted instruction classes in two schools; (3) most educational administrators agreed that computer education should be incorporated in the school curriculum to make students aware of the use of computers in their daily lives; and (4) the majority of the teachers agreed on the need to introduce computers in schools in many different forms and approaches although they were reluctant to expand existing facilities or to introduce new programs, and they unanimously expressed a need for teacher training in computer use. It is recommended: that a policy for computer education in Brunei be formed; that a formal teacher education program for computer training be organized; that preservice computer training be made available; and that existing activities be encouraged. (4 references) (DB)

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Computers in schools: The issues, problems and prospects

by

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Abstract

Are computers required to satisfy the social and economic needs of developing countries or merely to follow the example of other countries? Such questions arise in a place like Brunei, a tiny oil-rich sultanate in South East Asia with a population of approximately quarter of a million. Despite the fact that neighboring countries like Malaysia and Singapore have gone into the era of information technology, Brunei so far has no definite policy. This paper discusses some initial attempts to introduce educational computing in schools and issues involved in implementing such programs.

Introduction

Questions are often raised as to whether computers are required to satisfy the social and economic needs of developing countries or merely to follow the example of other countries? What structures are needed for their introduction and what functions will computers serve in promoting national development? Educational planners ponder these questions when considering the implementation of educational computing and information technology. The introduction of computer education requires considerable financial investment and decisions on hardware and software options are often difficult.

Hawkrige et al (1990) stress that governments of developing countries can no longer escape considering computers, but their policy on computers must be backed by an understanding of potential functions for computers in integrating systems, improving problem-solving and analysis, improving management, developing natural resources, maintaining international communication and national competitiveness.

Although computers have been around in Brunei for quite some time, there has been no widespread use in educational contexts. Educators in this region started taking interest in the use of computers in the early 1980s. The momentum of such introduction and subsequent progress vary from country to country.

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In Malaysia, for example, the Ministry of Education has set up a Computers in Education (CIE) program to introduce educational computing in all schools. Kumar (1991) reports that with the full support from the government, CIE becomes a reality. The project is also given a priority status to work together with Malaysian Institute of Microelectronic Systems. This joint collaboration has already produced a new low-cost PC called ATOM and currently developing an authoring system (Computer Integrated Learning Systems or ComIL), a software which is expected to become the core of the CIE project along with locally designed and made microcomputers.

The emphasis of the CIE project in Malaysia at this stage is to increase computer literacy among lower secondary students and the pilot project involved 60 schools. Once the pilot study is completed, work on the remaining 1350 secondary schools will commence. The report states that if the pilot study is successful at the secondary school level, about 8000 primary schools will be introduced. When computer literacy has been increased to an 'acceptable level', the teaching of subjects through computer will begin. More computer-related courses are expected to be introduced at the vocational training institutes, teacher training colleges and universities.

Schools in Singapore are more ambitious and are planning for the classroom which will be linked to remote multi-media type information databases where information can be called up by merely touching the screen. The national policy aims to bring Information Technology to the masses and this will eventually lead to widespread use of information technology. Information Technology will be used as a common educational tool, to strengthen social boundaries and to increase the convenience of living (Lian, 1991). With these broadly defined goals, the country is progressing very rapidly.

However, other nations have some reservations about the extent to which computers should be introduced in education. Some countries consider financial implications as a major factor. In the case of Brunei, there was an early head start in promoting use of computers in education, but the maintenance and progress of the program has been rather cautious as compared to other ASEAN countries.

The context

Brunei Darussalam is the least populated country in ASEAN with an estimated 256,000 population, but it has the highest GNP due to its oil wealth. The smallness of the country is reflected in the number of its schools and teachers (see Figure 1).

The school system in Brunei is divided into Government schools/colleges and non-Government schools. All children entering the Government school system at the age of five, stay at the pre-school level for one year before proceeding to the first year of primary schools. Education is provided free for citizens who attend Government schools. Tuition, textbooks, transport where

District	Primary				Secondary			
	Schs	Students	Teac	Ratio	Schs	Students	Teac	Ratio
Brunei	56	21585	1324	16.3	11	13658	1045	13.0
Tutong	33	4586	440	10.4	3	2879	246	11.7
Belait	15	4369	299	14.6	3	2814	202	13.9
Temburong	13	1596	135	11.8	1	798	64	12.4
TOTAL	117	32136	2198	14.6	18	20149	1557	12.9

Figure (1) Number of schools, students and teachers in Brunei *

* Source: Statistical yearbook 1991, Ministry of Education, Government of Brunei

necessary, board and lodging in hostels for students from rural areas, drink and cakes in urban and sub-urban schools and lunch in remote rural schools are all provided free to pupils who are citizens. Permanent residents are charged a nominal fee.

The use of computers in education has been one of the area most teachers are interested. There are some initial attempts to assess the use of computers in schools and one major project was launched in 1989. This survey attempted to find out the current status of the use of computers in schools.

This paper generally and qualitatively refers to the findings of an investigation by Jahrah and Maawiah (1989) as well as my own observations during school visits and results of discussions and interactions with teachers. It attempts to highlight some of the major factors which appear to determine the pace of development in using computers in schools. This is followed by some recommendations which may help to revive the local interest in the use of computers in schools in this context.

Major findings

To promote computer literacy in Brunei Darussalam schools, the Education Department through its Extra Curricula Activities Section has established various computer appreciation clubs. As early as 1984, clubs activities were existed in all its upper primary schools. The hardware is sponsored by Brunei Shell Petroleum Company Limited. Thus each school is equipped with at least four BBC Model B computers complete with disk drive, high resolution graphics colour monitor and printers.

Jahrah and Maawiah (1989) report that 81.3% of secondary schools in Brunei have computers. Most of the teachers in secondary schools have some knowledge of computers which they have acquired through self-study. The overall observation is that there is a shortage of qualified teachers for computer education in Brunei. The other factor is that while computers are available in most of the secondary schools, they are not evenly distributed. The BBC Model B is the prevalent type of computer in Brunei.

Since there is no definite policy, some schools rely on outside funding to acquire computers. This includes donations from parents, teachers and vendors. Like any other utilization pattern, computers are used for student records, staff records, general office work and time-tabling. Very few schools have experience in using computer assisted instruction. More details of the findings are as follows.

(i) *Computer clubs*

About 9 schools have computer clubs and membership varies from 20-80 depending on the size of the school. Membership of the computer clubs is usually offered to upper secondary students only.

The major aim of the computer clubs is to develop computer awareness and application, and to develop skills in programming and in the use of application programs. The main activities of the computer clubs are to conduct practice sessions for computer programming and the use of application programs such as wordprocessing.

Most schools arranged club activity sessions once a week for each member group, which usually lasts for 2 hours. Common problems faced by the computer clubs are shortage of qualified personnel to run the activities and inadequate space and provision of hardware.

(ii) *Computer classes*

Only two schools conduct computer classes. One school conducts them as a co-curricula activity and the other conducts them both as a co-curricula activity and as an elective subject in the formal curriculum. The main objective of these activities is to expose as many students as possible to computers, with emphasis on interaction with computers rather than on programming.

CAI / CAL software are also available in certain schools in the areas of Mathematics, Science, English, Geography and Economics. These programs are used for upper secondary level.

(iii) *Perceptions of administrators*

Regarding the role of computer education in the curriculum, most educational administrators agree that this should be incorporated in the school curriculum to make students aware of the use of computers in their daily lives. It is clearly recognized that there is a need to introduce computers in schools and it is recommended that each school has at least one computer laboratory.

The administrators identify several factors that could promote the introduction of computers in schools. Some of the suggestions include moral support from the authorities and the public, financial resources, availability of qualified as well as willing and dedicated personnel and, above all, readiness of the school.

It is firmly believed that if educational computing is properly introduced in schools, two major issues need to be addressed. The first issue is that there must be a definite policy and the other is to produce specific guidelines for carrying out the program.

(iv) *Perceptions of teachers*

Opinion on the use computers in education vary from one teacher to another. While the majority of the teachers agree on the need to introduce computers in schools in many different forms and approaches, many of them are reluctant to expand the existing facilities or to introduce new programs. This is understandable, since one of the major obstacle in such use is the lack of qualified personnel.

However, nearly 80% of the teachers in the survey indicate that they are in favour of having specialized computer courses as optional courses for students at the upper primary level.

The need for training was also unanimously expressed by the teachers.

Recommendations

Clearly, there is a need for a policy concerning computer education in Brunei. This should be specifically addressed to (i) whether or not to incorporate computer education into the formal curriculum, which means whether computing should be a general subject or an optional subject and (ii) at which level computer education should be offered and when to start the program.

There are two possibilities for developing computer literacy among school children in Brunei, that is, to develop it through computer clubs or by

incorporating it into the formal curriculum as a general subject offered to all students. Such introduction requires confirmation from the authorities in terms of planning, preparation of the syllabus, textbooks and hardware selection.

Above all the urgent need in Brunei is for more qualified teachers who can not only run the computer clubs, but also conduct computing courses. The survey indicates that more than 70% of the secondary school teachers in Brunei had gained their knowledge of computers through self-study. In order to have a more effective introduction, there is a need for formal training programs initiated by the Ministry of Education.

It is recommended that the University should offer courses related to the role of computers in education and educational computing in pre-service teacher training programs as well as conduct in-service training courses for teachers who are interested in this field.

In this respect local and regional training institutions might play an important role and more exchanges and interactions are needed between the schools and the training institutions.

Finally, it is essential that attempts be made to help the existing activities to gain momentum and to initiate a more concrete and viable computer in education program. This should be one of the priorities if the country's manpower requirements in coming years are to be met.

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Biographical Notes

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